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THIS IS UNEVALUATED INFORMATION
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1. In general, the electrical measuring instruments situation in Poland was very critical. Usually the instruments were not available or they were of inferior quality. Three general factors affected the instrument situation in Poland:

   a. The shortage of electrical instruments was mainly the result of the fact that very few instruments were manufactured in Poland and that the instruments had to be procured from other Satellite countries or from Western countries.

   b. The difficulty of procuring instruments was caused in large measure by the complicated administrative procedures prescribed in ordering instruments. All purchases must be made through the State Commission for Economic Planning (PKPG), which was subordinate only to the Council of Ministers [redacted] 25X1A

   c. Another difficulty in the instrument field was the contradictory policy of the Government in respect to relations with other Communist countries. On the one hand, it advocated that Poland be self-sufficient in the instrument field and prevented exchange of scientific information between the Satellites. Scientists were told by Government authorities to reveal only the bare minimum of information to visiting engineers from neighboring Satellites. Purchasing from other countries was greatly discouraged. On the other hand, all Satellite countries were supposed to cooperate to the fullest extent. [redacted] 25X1X 25X1X

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25X1X [redacted] when the Ministry of Machine Industry bought a rather elaborate apparatus from Czechoslovakia for making paper condensers, it never occurred to the Ministry that Poland had no paper suitable for this work, nor did the Czechs mention that a special type of paper would be required. In general, scientists would gladly exchange information but they were afraid to do so.

2. Instruments made in Poland were usually of inferior quality because one or another required material was not available. For instance, the Ministry of Machine Industry proposed that Pupin coils should be built in Poland. This proved impossible, however, because Poland had no core materials. Occasionally, small lots of instruments were manufactured by a Polish professor or his assistant in a laboratory in order to earn some additional money, but factories were not permitted to divert labor or materials to make anything that was not provided for in the state plans. Flow meters were not factory-produced but a few of them have been made by staff members of the Polytechnic Institute in Warsaw for their own use.

3. 25X1X [redacted] 25X1X It was always the same problem and in Poland we would say that the Ministry of Machine Industry likes to talk of building a chimney but never thinks of the brick. Top officials liked to propound but whenever they were pressed for details they would reply that they were not specialists and then would promise to appoint a commission to take up the matter; and there the matter rested.

4. 25X1X [redacted]

5. The Industrial Institute for Communications made Rochelle salt crystals. Practically no quartz was available. The Electrical Instrument Factory A-3 in Wtochy, near Warsaw, made voltmeters, ammeters, and watt-hour 25X1A meters. [redacted] It was the only electrical measuring instrument factory in Poland. One serious trouble with electrical instruments was that the sensitivity changed by as much as 25% over a period of 30 days. This was due primarily to the fact that the alloy magnets were put into use before they had time to age or season. The magnets were cast, ground, and magnetized by the Baildon Steel Works in Upper Silesia. Jewels for bearings were difficult to obtain. Instruments above the milliampere range were seldom seen. The Baildon plant also supplied parts to a factory in Wrzesnia which produced permanent magnet type loud speakers of 1.5, 4 and 15 w. capacity.

6. The Technical Institute in Gliwice has produced some experimental sintered magnets but these have not yet been used in high frequency circuits. Professor SMOLINSKI of the University of Warsaw was interested in this work. The Gliwice Institute also made standard cells in small quantities. Plant A-1 in Warsaw produced a temperature controller and an inferior cathode ray oscilloscope [redacted] 25X1X Lenses, microscopes, and binoculars were made by a state-owned plant, 25X1C PZO, in Warsaw, but [redacted]. It is possible that the firm Wichmar in Warsaw made some microscopes and magnifying 25X1X glasses, [redacted] Ordinary gauges, [redacted] available [redacted] 25X1X.

7. Heavy machines such as lathes and drill presses were produced in Poland, but there was no such thing as precision machines because the "green" casting would warp out of line. Transformers of large capacity, (100 kw.) were produced. Electric clocks and alarm clocks of inferior quality were also made in Poland. A gasoline tractor, the Ursus, was manufactured in Warsaw as was a passenger automobile, called the Warszawa. This car was patterned after the Russian Popieda and was manufactured by the FSO Zeran plant. There are more cars and trucks in Poland today than before World War II [redacted] There are still a few privately owned cars -- all of pre-World War II types. [redacted] no Diesel motors were produced in Poland. A former German factory, Wytwornia Licznikow Elektrycznych in Swidnica near Wroclaw, built watt-hour meters.

8. Poland did not produce photographic equipment, infrared apparatus, spectrometers, spectrographs, geoprospecting gear, electron microscopes, acoustical instruments, string oscillographs, standard resistors, capacitors, thermopiles, tachometers, or dynamic speakers.

9. Poland received most of her imports from the following countries:

a. East Germany was the chief source of instrument importation. The instruments were of good quality. Of late, Apparate Werke, Berlin--Treptow (formerly AEG) has not been permitted to sell instruments to Poland. [redacted] heir output is sent to the USSR.

b. Czechoslovakia supplied voltmeters, ammeters, and wattmeters of good quality.

c. Most of Poland's instrument standards come from Austria. These included Wheatstone bridges, Thompson bridges, potentiometers of the precision type, etc. The Norma plant in Vienna supplied most of these items and they were of excellent quality.

d. Instruments from Hungary were poor in sensitivity, accuracy, and mechanical construction.

e. Switzerland supplied semiprecious stones such as sapphires and agates for instrument bearings.

f. Poland used to receive many instruments from Sweden. In recent years, however, the quality of goods received from Sweden has been very low. [redacted]

g. The only Soviet instrument [redacted] oscillograph. Despite the [redacted] Germany because of the excellent workmanship.

10. The shortage of the following was very acute: electric sockets, extension cords, small drills, taps, dies, abrasives, emery cloth and grinding wheels, ball bearings, wood and metal screws, and machine tools of fine quality. Czechoslovak tools were much better and much cheaper than domestic products.

11. The standards and units of measurement used were metric -- as in Germany. There was a Central Bureau of Weights and Measures in Warsaw. [redacted] that the adoption of the Soviet system of weights and measures was under consideration. The physical standards of length and mass were all imported from Germany. There was a standard astronomical clock in Krakow and a standard frequency oscillator in Warsaw, with a precision of one hertz, which was coordinated with a

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frequency standard signal originating in London. In addition to the primary frequency standard in Warsaw, there were branches in several other laboratories in Poland.

Gera Condenser Works

12. 25X1X [redacted] 25X1X

[redacted] This plant consisted of two buildings. The old one was three stories high, and the other, which was comparatively new, was four stories high. It employed approximately 1,000 to 1,200 workers of all ages with a ratio of about three women to two men. The plant was not at all modernized or mechanized. Everything was done by hand. The plant produced the following types of condensers:

a. Electrolytic. These were made with aluminum oxide and impregnated with an electrolyte. They were made in two sizes; 75 v., 5,000 mf. - having dimensions of about 10 cm. x 2 cm., and a high potential condenser of 550 v., in the 8, 16, and 32 mf. sizes. The containers were made of polystyrene. All condensers were unidirectional.

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b. Polystyrene condensers. These condensers were non-inductively wound. They were enclosed in an airtight aluminum tube. The accuracy was between .2 and .5 of one per cent with the temperature range between minus 40 and plus 70° C. The losses were very small compared to those incurred when using mica condensers. The 210 v. condensers had a capacity of .001 microfarads. The high voltage condenser, that is, from 4 to 10,000 v., had a maximum capacity of one-half microfarad. The conductor was aluminum and the separator was a very thin sheet of polystyrene. These condensers were used as standards. They were costly but were not so expensive as the corresponding mica condenser.

c. Metalized paper condensers. These condensers were made by passing a special strip of paper about 50 cm. wide between rollers similar to those of a printing press, which printed several violet colored strips about two centimeters wide on the paper. The material smelled like amylacetate or acetone and affected the eyes in the same way. After the paper had been printed, it was run through an evacuated cylinder at a temperature of about 100° C. The violet colored stripe assumed a very bright metallic surface. The paper was then cut in strips and again wound non-inductively on a spool which was then dipped in an artificial wax in a liquid state under vacuum. The condenser was then placed in a sheet iron container which was sealed airtight. The microfarad condensers were tested at 250 v. and had a working potential of 150 v., DC. They were about 18 x 30 x 30 mm. in size. A smaller condenser, about 10 x 30 x 30 mm., having a capacity of .05 mf., was also available. An interesting point was the ease with which the workers soldered copper wires to aluminum when making these condensers which were produced for military receivers and measuring apparatus. More of these condensers were made than those of the polystyrene type. The containers were first plated with copper and then with nickel and then lacquered.

d. Paper-oil condensers. These condensers were made in various sizes for various voltages using paper and aluminum foil in the usual way. They had an induction-free winding. They were evacuated and then filled with oil. The lead-ins were made through glass beads and the assembly was airtight but not a true vacuum. Capacities ran from a few microfarads to 10,000 mfs. and from 15,000 to 20,000 v. The power loss was one tenth of one per cent. These were made in large numbers [redacted] 25X1X

[redacted]

e. No ceramic condensers were made at Gera.

13. Large coupling condensers were produced by Turbonit Werke in Berlin and by Transformatoren Werke, also in Berlin. These condensers were used to couple a high potential line with a high frequency oscillator for telemetering and power control. They were made at Turbonit Werke for 30, 60, 120, and 220 kv. They were about two meters high and 60 cms. square. These appeared to be made on order, with several workers working on each condenser. These condensers were about twice as heavy as the Swedish condenser of the same specifications.

14. Poland had ordered high frequency telecommunication equipment for power stations from Sweden the delivery of which was extended over a period of two or three years, the cost depending on the current price at time of delivery. [redacted] 25X1X to go with these high frequency telemetering installations. High frequency telemetering was coming to be used more and more in the USSR.